National Space Science Data Center/
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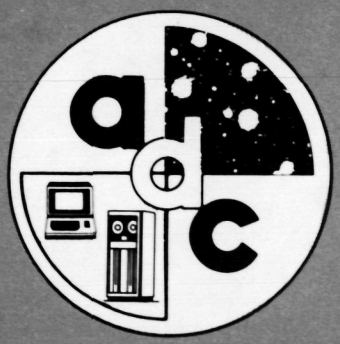
84-04

Documentation for the Machine-Readable Version of A Supplement to the Bright Star Catalogue (Hoffleit, Saladyga and Wlasuk 1983)



February 1984

NSSDC/WDC-A-R&S 84-04

DOCUMENTATION FOR THE MACHINE-READABLE VERSION

OF

A SUPPLEMENT TO THE BRIGHT STAR CATALOGUE

(HOFFLEIT, SALADYGA AND WLASUK 1983)

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February 1984

National Space Science Data Center (NSSDC)/
World Data Center A for Rockets and Satellites (WDC-A-R&S)
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(HOFFLEIT, SALADYGA AND WLASUK 1983)

ABSTRACT

Detailed descriptions of the three files of the machine-readable catalog are given. The files of the original tape have been restructured and the data records reformatted to produce a uniform data file having a single logical record per star and homogeneous data fields. The characteristics of the tape version as it is presently being distributed from the Astronomical Data Center are given and the changes to the original tape supplied are described.

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SECTION 1 - INTRODUCTION AND SOURCE REFERENCE

A Supplement to the Bright Star Catalogue (YBS4S; Hoffleit, Saladyga and Wlasuk 1984) is an extension of the recently published YBS4 (Hoffleit 1982) and contains compiled data on stars for which photoelectric determinations are given as $< 7.10^V$ and which are not already included in the latter catalog. The data included in the Supplement are basically the same as those in the YBS4 itself and the format of the machine version is very similar. Notable differences are that the NAME column has been omitted (since very few Supplement stars have Bayer or Flamsteed designations) and has been replaced with SAO (Smithsonian Astrophysical Observatory Staff 1966) numbers. Also, the parallax field includes only data determined from trigonometric methods; all dynamical parallaxes have been relegated to the REMARKS. Position-angle data are given in the main table for double stars, whereas they were contained, if reported, only in the REMARKS file of the YBS4. Remarks for Supplement stars are given in a separate file of the machine version and are present for 49 percent of the stars. The literature search undertaken for compilation of the YBS4S extended through 1981, although the authors state that it was not necessarily exhaustive in all categories, and that many data from more recent publications are included.

This document decribes the machine-readable version of *A Supplement to the Bright Star Catalogue* and is intended to enable users to read the magnetic tape and process the data without problems and guesswork. For additional details concerning the data compilation, sources, completeness of the catalog, and statistics on the multiplicity of components, the source reference should be consulted. Since the original machine-readable version has undergone format restructuring and revision at the Astronomical Data Center, a copy of this document should be supplied if any secondary copies of the catalog originating from the ADC are supplied to other users or installations.

SOURCE REFERENCE

Hoffleit, D., Saladyga, M. and Wlasuk, P. 1984, *A Supplement to the Bright Star Catalogue* (New Haven: Yale University Observatory).

SECTION 2 - TAPE CONTENTS

Byte-by-byte descriptions of the contents of the machine-readable YBS4S catalog are given in Tables 1-3. A suggested FORTRAN format specification for reading each data field is given in Table 2 and can be modified depending upon individual processing and programming requirements (FORTRAN 77 character string-type formats are given); however, caution is advised when substituting format specifications, since some data fields contain character data and others are blank when data are absent. Particular care is required for color-index data, where valid 0.00 values can exist, but where fields are blank for non-existent data. It is safest to buffer in records in an unformatted mode, or read them in character (A) format and test for blank data fields before processing with numerical formats. For such fields, numerical format specifications are given to indicate decimal-point locations, while alternate A-type formats are specified in parentheses. Default values are always blanks in data fields for which primary suggested formats are given as A.

Table 1. Tape Contents. *A Supplement to the Bright Star Catalogue.* Introductory File.

Bytes	Description
1-80	Introductory text file in upper and lower case characters. The file contains a brief introduction with a description of the compilation procedure, a summary of the completeness of the catalog, descriptions of the figures in the published edition, acknowledgments, two short tables containing statistics on completeness and multiplicity, brief columnar descriptions of the data, and miscellaneous remarks concerning abbreviations used in the remarks file.

Table 2. Tape Contents. *A Supplement to the Bright Star Catalogue.* Data File.

Byte(s)	Units	Suggested Format	Default Value	Description
1- 6	---	I6 (A6)	blank	Number in the *Henry Draper Catalogue* (HD) (Cannon and Pickering 1918-1924).
7- 8	---	A2	---	HD suffix. May be component identifications for multiple systems or /X when more than a single HD star is included, e.g. HD 17245/6.
9	---	1X	---	Blank
10	---	A1	---	Sign of Durchmusterung (DM) zone.
11- 12	---	A2 (I2)	---	DM zone.
13	---	1X	---	Blank
14- 18	---	A5 (I5)	---	DM number.
19	---	1X	---	Blank
20- 25	---	A6 (I6)	---	SAO Catalog number if one exists.
26	---	1X	---	Blank
27	---	A1	---	An "I" is present if the star occurs in the NASA *Merged Infrared Catalogue* (Schmitz *et al.* 1978).
28- 35	---	A8 (8A1)	---	Double or multiple star identifications (except spectroscopic and eclipsing): W Worley (1978; see Worley 1982) update of the IDS (Jeffers *et al.* 1963) C Couteau 1978 D Duplicity discovered by occultation The field is uniform on the tape (see Section 4, #6) with the catalog codes in byte 28, ADS (Aitken 1932) numbers in bytes 29-33, and multiple-star letter designations for components of a system which the HD number represents in bytes

Table 2 (continued)

Byte(s)	Units	Suggested Format	Default Value	Description
				34-35. Additional notes on duplicity may be found in the REMARKS file if an asterisk occurs in the notes column (byte 212).
36	---	1X	---	Blank
37- 47	---	A11 (11A1)	---	Variable-star designations: (*a*) constellation designations from the *General Catalogue of Variable Stars* (Kukarkin *et al.* 1969-70), its supplements 1-3 (Kukarkin *et al.* 1971, 1974, 1976) and the 62nd through 66th Namelists (Kukarkin *et al.* 1977; Kholopov *et al.* 1978, 1979, 1981); (*b*) numbers (alone) from the *New Catalogue of Suspected Variable Stars* (Kukarkin *et al.* 1982); (*c*) Var and Var? for unnamed variables and suspected unconfirmed variables not included in the General and Suspected catalogs. Can apply to the HD number and/or a close companion. Note: HD 139216 = τ^4 Ser is recorded as "@t|4 Ser" where the character following the t is a vertical bar.
48	---	1X	---	Blank
49- 50	hours	I2	---	Right ascension (α) for 1900.
51	---	1X	---	Blank
52- 53	min	I2	---	α_{1900}
54	---	1X	---	Blank
55- 58	sec	F4.1	---	α_{1900}
59	---	1X	---	Blank
60	---	A1	---	Sign of declination (δ) for 1900.
61- 62	°	I2	---	δ_{1900}
63	---	1X	---	Blank
64- 65	'	I2	---	δ_{1900}
66	---	1X	---	Blank
67- 68	"	I2	---	δ_{1900}
69	---	1X	---	Blank

Table 2 (continued)

Byte(s)	Units	Suggested Format	Default Value	Description
70- 71	hours	I2	---	Right ascension (α) for 2000.
72	---	1X	---	Blank
73- 74	min	I2	---	α_{2000}
75	---	1X	---	Blank
76- 79	sec	F4.1	---	α_{2000}
80	---	1X	---	Blank
81	---	A1	---	Sign of declination (δ) for 2000.
82- 83	°	I2	---	δ_{2000}
84	---	1X	---	Blank
85- 86	'	I2	---	δ_{2000}
87	---	1X	---	Blank
88- 89	"	I2	---	δ_{2000}
90	---	1X	---	Blank
91- 96	°	F6.2	---	Galactic longitude ℓ^{II}.
97	---	1X	---	Blank
98-103	°	F6.2	---	Galactic latitude b^{II}. Sign always in byte 98.
104	---	1X	---	Blank
105-108	mag	F4.2 (A4)	---	*V* magnitude on *UBV* system. Magnitudes of variables and/or binaries may be reported to 0.1 mag only, in which case byte 108 is blank.
109	---	1X	---	Blank
110-114	mag	F5.2 (A5)	blank	*B-V*. Sign always in byte 110.
115	---	1X	---	Blank
116-120	mag	F5.2 (A5)	blank	*U-B*. Sign always in byte 116.
121	---	1X	---	Blank
122-126	mag	F5.2 (A5)	blank	*R-I* on system indicated by code in byte 127. Sign always in byte 122.

Table 2 (continued)

Byte(s)	Units	Suggested Format	Default Value	Description
127	---	A1	---	Code for *R-I* system: blank - on Johnson system; E - mainly from Eggen, on Kron system; C - from Cousins, close to Kron system (the Johnson and Kron filters have different λ_{eff} and may not be used interchangeably).
128-147	---	A20	---	Spectral type. If the complete modern classification is too long for the data field, it is given in the remarks file and an asterisk (*) occurs in this data field. Mt. Wilson luminosity classes are given as lower case letters in bytes 128-129. The "W" in Wolf-Rayet types is in byte 129 with the C or N in the following byte (130). In general, the temperature class (O, B, A, ..., S, C) occurs in byte 130 and the temperature subclass in byte 131 (intermediate subclasses extend to 132-133 and other characters can be in bytes 131, ...). Characters normally appearing as lower case in standard notation, e.g. p, e, Si, Mn, Hg, Iab, are coded in lower case. A δ appearing for HD 189337 is coded as "@d".
148	---	1X	---	Blank
149-154	"	F6.3 (A6)	blank	Annual proper motion, μ_α, in right ascension. Sign always in byte 149.
155	---	1X	---	Blank
156-161	"	F6.3 (A6)	blank	Annual proper motion, μ_δ, in declination. Sign always in byte 156.
162	---	1X	---	Blank
163-167	"	F5.3 (A5)	blank	Trigonometric parallax, π_t. Sign always in byte 163. Dynamical parallaxes are given in the remarks file.
168	---	1X	---	Blank

Table 2 (continued)

Byte(s)	Units	Suggested Format	Default Value	Description
169-172	km s^{-1}	I4 (A1,I3)	blank	Radial velocity (see codes in following field).
173-177	---	A5	---	Radial-velocity code: V, V? - variable or suspected variable velocity; SB, SB1, SB2 - spectroscopic binaries, single or double lined spectra; O - orbital data available.
178-179	---	2X	---	Blank
180	---	A1	---	Projected rotational velocity, $v \sin i$, descriptive characters "<", ">", "≤" (hexidecimal character 8C), "≥" (hexidecimal character AE) can occur.
181-183	km s^{-1}	I3 (A3)	blank	$v \sin i$.
184	---	A1	---	Colon (:) for uncertain $v \sin i$ (no occurrences at present).
185-188	mag	F4.1 (A4)	blank	Δm - magnitude difference between two components of a double, or between the two brightest components of a multiple system.
189	---	A1	---	Δm code. Code "V" indicates variable magnitude difference, but also reserved for uncertainty indicator (:); no occurrences at present.
190	---	1X	---	Blank
191-195	"	F5.1 (A5)	blank	Separation of the components referred to in bytes 185-188.
196	---	A1	---	Separation code: an "a" occurs if the separation refers to the semimajor axis of the orbit.
197-198	---	2X	---	Blank

Table 2 (concluded)

Byte(s)	Units	Suggested Format	Default Value	Description
199-202	°	A4	---	Position angle (PA) for the components referred to in bytes 185-188. NOTE: The characters "ORB" can occur to indicate an available orbit; hence, no PA. The character abbreviations "SP" (south preceding), "SF" (south following), and "S" also occur.
203	---	A1	---	PA code (: for uncertainty).
204	---	1X	---	Blank
205-209	---	A5	---	Identification of components represented in bytes 185-188 and 191-195. The character "O" indicates an occultation binary.
210-211	---	I2 (A2)	blank	Number of components assigned to multiple systems.
212	---	A1	---	An asterisk (*) indicates that further information can be found in the remarks file.

Table 3. Tape Contents. *A Supplement to the Bright Star Catalogue.* Remarks File.

Byte(s)	Suggested Format	Description
1- 6	A6 (I6)	HD number. Number present only if start of remark for new star; otherwise blank.
7- 8	A2	HD suffix (see bytes 7-8 of Table 2).
9	1X	Blank
10- 13	A4	Remark category abbreviation (upper case character[s] starting in byte 10): N - star names and identifications; C - magnitudes, colors, color excesses; S - spectra;

Table 3 (concluded)

Byte(s)	Suggested Format	Description
		Var - variability, magnitude ranges, spectrum or magnetic field variability or other characteristics; SB - spectroscopic binaries, mostly orbital data: period of revolution, K - half amplitude of radial velocity, K$1, K$2 - semi-amplitude in RV for each of the components of SB2 system, V$0 - <RV> of system, $m\sin^3 i$ - mass function in Solar masses, $a \sin i$ - projected semimajor axis in units of 10^6 km; RV - radial and rotational velocities; D - double and multiple stars, including astrometric and those discovered by occultations and speckle interferometry. Orbital data given, including magnitudes and spectral types of major components, orbital periods, semimajor axes, etc.; Dyn - dynamical parallaxes; R - stellar radii or diameters; G - membership in clusters, associations, groups and apparent association with nebulosity (R associations). No attempt made to resolve conflicting assignments in different sources: various alternatives are included; M - miscellaneous notes.
14	1X	Blank
15- 64	A50	Remarks in free text (upper and lower case) form.

For printing only, the notes can, of course, be read with a format specification (FORTRAN 77) of A64. An extended chain printer is recommended due to the upper and lower case and special characters. If such a printer is available, it may be desirable to decode the Greek subscript and superscript characters, in which case the translation tables at the end of File 1 should be used.

SECTION 3 - TAPE CHARACTERISTICS

The information in Table 4 is sufficient for a user to describe the indigenous characteristics of *A Supplement to the Bright Star Catalogue* to a computer. Information easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, tape density, number of tracks, and internal coding (EBCDIC, ASCII, etc.) is not included. These parameters should always be transmitted if secondary copies of the catalog are supplied to other users or installations. Parameters for the three files are separated by commas.

Table 4. Tape Characteristics. *A Supplement to the Bright Star Catalogue.*

NUMBER OF FILES	3
LOGICAL RECORD LENGTH (BYTES)	80, 212, 64
RECORD FORMAT	FB*
TOTAL NUMBER OF LOGICAL RECORDS	412, 2611, 3581

* Fixed block length (last block may be short)

SECTION 4 - REMARKS, MODIFICATIONS, ACKNOWLEDGMENTS AND REFERENCES

A magnetic tape of *A Supplement to the Bright Star Catalogue* was received from Dr. Dorrit Hoffleit of Yale University on 11 August 1983. The original tape contained nine files with a brief tape description, formats, translation tables, introduction, data (left pages), data (right pages), addenda (left pages), addenda (right pages), and remarks. The tape files were restructured and the data reformatted to produce a catalog similar in structure and format to *The Bright Star Catalogue*, 4th Revised Edition (Hoffleit 1982). The steps followed to produce the current tape are outlined below:

1. All tape files were transferred to disk storage for easy access.

2. The tape description and formats applied specifically to the tape received and were deleted.

3. The introduction and translation tables were merged to become file 1 of the new tape. Minor editing was done to remove carriage control characters and to correct a few errors.

4. The left- and right-page data files were combined, while eliminating redundant star identifications present at the beginnings of the two separate records, to produce uniform records containing all data for one star.

5. The addenda files, containing data for eight stars, were combined and merged into the main data file in their proper order.

6. The double-star fields (bytes 28-35) were not uniform: (*a*) numbers and letters occupied the same columns; (*b*) the letter codes for catalogs and components were not always in the same positions; (*c*) ADS numbers ($< 10^4$) were not right justified. The data field was reviewed throughout the catalog and edited to position all catalog codes (W,C,D) in byte 28, all ADS numbers right justified in bytes 29-33, and multiple-star component designations left justified in bytes 34-35.

7. The descriptive characters for ≤ and ≥ occurred as two bytes (<=,>=) and the < character was not always in the same position. The former two-byte characters were changed to ≤ (hexidecimal code 8C) and ≥ (hexidecimal code AE) and all descriptive characters were located in byte 180. Installations not having these characters (they do not presently exist in ASCII) will need to detect the hexidecimal codes and convert them to other characters (e.g. "-" and "+", respectively) if printed representation is desired.

8. Mount Wilson luminosity classes (d, g, sg, etc.) and Ws in Wolf-Rayet types were aligned to the left of the spectral-type field (bytes 131-147 originally). Since temperature class and subclass alignment was desired, the former were moved to bytes 129-130 and the latter to byte 130 (they are mutually exclusive).

9. The remarks file was received as a 132 bytes/record file having only 65 bytes used and the first byte blank. The file was edited, e.g., a character appearing as an upper right corner was changed to a degree (°) sign for all occurrences. The blank first byte was removed and the file changed to 64 bytes/record.

10. The D remark for HD 37042 was corrected according to a note received from Dr. Hoffleit on 30 August 1983.

ACKNOWLEDGMENTS

Appreciation is expressed to Dr. E. Dorrit Hoffleit and her colleagues for preparing and sending the magnetic tape of the catalog. Dr. Hoffleit kindly communicated additional corrections to the catalog and reviewed this document in preprint form before final printing.

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SECTION 5 - SAMPLE LISTING

The sample listings given on the following pages present logical data records from each file just as they are recorded on the tape. Groups of records from the beginning and end of each file are illustrated. The beginning of each record and bytes within the record are indicated by the column heading across the top of each page (digits read vertically). Since file 2 contains more than 115 bytes per record, the remaining bytes (116-212) are printed in a second row.

```
L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

              TAPE FILE NAME: YBS4 Supplement, Introd.
                     RECORDS        1 TO       30
                   TAPE FILE       11
                 RECORD LENGTH     80 BYTES
                  INPUT VOLSER    ADC005

C O L U M N                                                                                                         111111111111111
H E A D I N G           1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
I N D E X     123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD       1 Supplement to the BRIGHT STAR CATALOGUE
RECORD       2
RECORD       3
RECORD       4 INTRODUCTION
RECORD       5
RECORD       6    The Bright Star Catalogue (BS) was ostensibly complete to magnitude
RECORD       7 6.50v on the visual system of the HR catalogue (Harvard Revised
RECORD       8 Photometry, Harvard Annals, vol. 50, 1908).  Included in the HR were
RECORD       9 over 500 stars fainter than 6.50v, of which 26 had magnitudes between
RECORD      10 7.00 and 7.64v.  Following Frank Schlesinger, who compiled the first
RECORD      11 two editions of the BS (1930 and 1940), we have included in the third (1964)
RECORD      12 and fourth (1982) editions only the stars with HR numbers.  Subsequently a
RECORD      13 number of complaints have been received because numerous stars now known to
RECORD      14 be brighter then 6.50V in the modern photoelectric UBV system are not included
RECORD      15 in the BS.  All of the stars that were specifically called to our attention
RECORD      16 had actually been listed as fainter than 6.50v in the Harvard photometric
RECORD      17 catalogues that were available when the HR was being assembled.  In response
RECORD      18 to the criticism, however, we have now collected data on stars for which
RECORD      19 photoelectric determinations are given as 7.10V or brighter and which are not
RECORD      20 HR stars already in the BS (except for a few that occur in the REMARKS of
RECORD      21 the BS because they are companions to the BS stars).
RECORD      22
RECORD      23     The major sources for the selection of the Supplement stars have been
RECORD      24 the tapes provided by Carlos Jaschek of the Centre de Donnees Stellaires for
RECORD      25 the preparation of the fourth edition of the BS.  These are primarily Nicolet
RECORD      26 (A. and A. Supp. 34, 1, 1978) and Morel-Magnenat (A. and A. Supp. 34,
RECORD      27 477, 1978), although a great many other miscellaneous sources are represented.
RECORD      28 However, we make no claim to completeness.  Moreover, a few stars may
RECORD      29 inadvertently be included when a published value labelled V actually was meant
RECORD      30 to refer to a visual or photovisual determination (v).  This Supplement,
```

LISTING OF RECORDS FROM TAPE FILE

```
TAPE FILE NAME: YBS4 Supplement, Introd.
       RECORDS     383 TO     412
     TAPE FILE     11
 RECORD LENGTH     80 BYTES
  INPUT VOLSER   ADC005

C O L U M N                                                                                                                1111111111111111
H E A D I N G              111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111
I N D E X       1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD   383                  - - -    to represent % sign
RECORD   384
RECORD   385      °a          @y[h]    less-than/equal sign
RECORD   386      °b          @y[i]    greater-than-equal sign
RECORD   387      °r          @y[r]    slash (scribe's different from "/")
RECORD   388      °s          @!@g[9]@/.    (scribe overprint for ". sign)
RECORD   389
RECORD   390                  @g[2]    times sign (not letter X)
RECORD   391
RECORD   392
RECORD   393
RECORD   394
RECORD   395
RECORD   396            short versions of codes in LEFT PAGE file:
RECORD   397
RECORD   398
RECORD   399      short code    Scribe code
RECORD   400
RECORD   401
RECORD   402      @t!4 Ser      @g[t]@+[4] Ser      HD 139216 'tau4Ser'
RECORD   403
RECORD   404
RECORD   405
RECORD   406
RECORD   407
RECORD   408            short versions of codes in RIGHT PAGE file
RECORD   409
RECORD   410
RECORD   411      @d            @g[d]               HD 189337
RECORD   412                                        'lowercase greek delta'
```

```
L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

           TAPE FILE NAME: YBS4 Supplement, Data
                  RECORDS        1 TO       15
                TAPE FILE       12
            RECORD LENGTH     212 BYTES
             INPUT VOLSER    ADC005

C O L U M N                                                                                                 1111111111111111
H E A D I N G          111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111
I N D E X     123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345

RECORD      1     17   +34   5061  53630                           0  0   4.5 +35  0 55  0  5 13.0 +35 34 18 112.46 -20.36 6.87 +0.16
               +0.10         A3III              +0.018 -0.015
RECORD      2    268   -26      8 166063                           0  2 14.9 -25 54 46  0  7 22.6 -25 21 11  40.63 -79.96 7.06 +0.45
               +0.01         F5V                +0.227 -0.114
RECORD      3    371   +62      5  10999                           0  3 18.9 +62 38 51  0  8 32.3 +63 12 16 118.12 + 0.73 6.41 +1.02
               +0.71         G2/3II             -0.045 +0.017         -  6
RECORD      4    434   +27      3  73772                           0  3 50.7 +27 41 28  0  9  0.2 +28 14 53 111.69 -33.70 6.52
                             A3/F0              +0.025 +0.013         -  2V        60                             *
RECORD      5    443   +64      3  11005                           0  3 58.8 +64 30 48  0  9 18.6 +65  4 16 118.51 + 2.56 7.01 +0.92
               +0.67        dG9                 +0.277 +0.050 +.034 +  8                                          *
RECORD      6    480   -50     20 231947  W                        0  4  5.6 -50 43 25  0  9  8.5 -50 10  0 319.45 -65.58 7.06
                             B5V                +0.020 -0.016                           5.8   25.0      61
RECORD      7    593   +58     11  21164                           0  5 19.3 +59  7  1  0 10 34.6 +59 40 24 117.79 - 2.79 6.70 +0.02
               -0.75         B1V                +0.008 +0.000         -  6
RECORD      8    613   +32     11  53694                           0  5 22.2 +32 34 28  0 10 32.2 +33  7 48 113.15 -28.96 6.83 +1.43
               +1.66         K4III              -0.039 -0.033         - 20
RECORD      9    698   +57     28  21190           74              0  6 21.4 +57 39 20  0 11 37.0 +58 12 43 117.69 - 4.25 7.08 +0.18
               -0.40         B5IIe              -0.006 +0.001         - 25SBO      50                             *
RECORD     10    725   +56     16  21193                           0  6 29.2 +56 42 55  0 11 44.8 +57 16 17 117.56 - 5.19 7.09 +0.63
               +0.59         F5Ib-II            +0.004 -0.006
RECORD     11    761   +52     19  21202      148                  0  6 52.9 +53  4  4  0 12  8.0 +53 37 25 117.05 - 8.80 6.81 +0.25
               +0.02         A7Vn+F2V           +0.034 -0.013                       192 0.8    0.2a   [illegible]     *
RECORD     12    861   +61     16  11044                           0  7 52.9 +61 29  7  0 13 12.4 +62  2 28 118.47 - 0.50 6.64 +0.19
                             A2/F2              +0.050 -0.015         - 12SBO                                     *
RECORD     13    936   +59     15  21224                           0  8 37.3 +59 26 37  0 13 56.4 +59 59 58 118.26 - 2.53 6.88 +1.12
               +0.88         G7.5IIab           +0.039 +0.000         -  0
RECORD     14    941   -23     52 166132                           0  8 40.0 -23 46 14  0 13 45.5 -23 12 46  55.53 -80.62 6.86 +1.12
               +0.93         K0III              +0.139 -0.056                                                     *
RECORD     15   1000   -21     17 166138                           0  9 16.6 -21 45 11  0 14 20.8 -21 11 26  66.01 -79.67 6.91 +0.47
               +0.07         F8V                -0.071 -0.230
```

L I S T I N G O F R E C O R D S F R O M T A P E F I L E

TAPE FILE NAME: YBS4 Supplement, Data
RECORDS 2597 TO 2611
TAPE FILE 12
RECORD LENGTH 212 BYTES
INPUT VOLSER ADC005

COLUMN HEADING INDEX

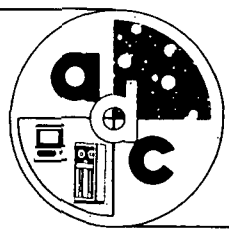
```
                1111111111222222222233333333334444444444555555555566666666667777777777880000000089999999990000000001111111
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
```

```
RECORD   2597 224155   + 7  5101 128472                          23 50 30.8 + 7 40  1 23 55 37.5 + 8 13 24 100.04 -52.15 6.79 -0.02
              -0.06 -0.01C  A0V                 +0.002 -0.002       - 2
RECORD   2598 224166.  +45  4363  53487                          23 50 34.6 +45 48  7 23 55 38.0 +46 21 30 112.99 -15.43 6.96 -0.07
              -0.41         B9pSi               +0.020 -0.010       - 18                                              *
RECORD   2599 224186   +14  5074 108911 I         14761          23 50 47.8 +14 40 26 23 55 54.8 +15 13 48 103.63 -45.55 6.3  +1.58
              +1.67 +1.15   M3III               +0.103 -0.015       +  4                                              *
RECORD   2600 224364   +60  2647  20954 I 17119                   23 52 17.6 +60 28 11 23 57 19.5 +61  1 34 116.42 - 1.16 6.60 +1.62
                            M2.5III:Ca1         -0.009 -0.001       - 76V:          2.8   363.5     84  AC    5*
RECORD   2601 224429   +10  5013 108931   17125                   23 52 39.2 +10 55  5 23 57 46.1 +11 28 28 102.54 -49.26 6.62 +0.01
              -0.04         B9V                 +0.013 -0.003       +  4        245   3.7    20.7    133
RECORD   2602 224583   -57  10393 248090          S Phe            23 53 54.0 -57  7 55 23 59  4.3 -56 34 32 316.99 -59.10 6.93 +1.64
              +1.23 +1.35   M6IIIe              -0.010 +0.005       +  10V                                            *
RECORD   2603 224596   -42  16545 231874                          23 54  0.0 -42 47 38 23 59  9.6 -42 14 16 334.79 -71.51 6.77 +0.21
                            A7Vn                +0.049 +0.022       +  16
RECORD   2604 224721   +37  4912  73668                           23 55  6.5 +37 44 52  0  0 12.7 +38 16 14 112.00 -23.48 6.54 +0.96
              +0.72         G5                  +0.004 -0.021
RECORD   2605 224782   -53  10565 248097  d                       23 55 24.7 -53 39 15  0  0 34.1 -53  5 50 319.49 -62.36 6.50
                            G0/2IV              +0.042 -0.009                         3.5    1.9    312
RECORD   2606 224792   +61  2580  20994                           23 55 36.9 +61 37 13  0  0 41.4 +62 10 32 117.05 - 0.11 7.05 +0.49
                            F6V                 -0.054 -0.048       +  16
RECORD   2607 224850   -42  16563 231898                          23 56  8.7 -42  2 39  0  1 17.0 -41 29 12 335.35 -72.34 7.03 +1.55
                     +0.73E K5III               +0.037 -0.025                                                         *
RECORD   2608 224890   +72  1135  10934                           23 56 32.1 +73  3 20  0  1 39.3 +73 36 45 119.38 +11.09 6.52
                            A1/F2               +0.071 +0.009       -  9                                              *
RECORD   2609 224980   +59  2816  21020 I                        23 57 10.7 +60  8 48  0  2 17.5 +60 42 12 116.95 - 1.60 6.73 +1.82
                            K8III               -0.015 -0.008       -  24
RECORD   2610 225187   -30  19809 192345          9               23 59  4.9 -30 41 30  0  4 11.7 -30  8  7 13.97 -79.21 7.10 -0.09
              -0.33 -0.04C  B9V                 -0.001 +0.014       +  18V                                            *
RECORD   2611 225257   +57  2855  21062      36                   23 59 45.3 +57 58 32  0  4 54.9 +58 31 55 116.88 - 3.79 6.62 +0.04
              -0.56         B3V                 +0.011 -0.011       +  11SB2          2.1    3.7    299
```

LISTING OF RECORDS FROM TAPE FILE

```
TAPE FILE NAME: YBS4 Supplement, Remarks
       RECORDS      1 TO     30
     TAPE FILE     13
 RECORD LENGTH     64 BYTES
  INPUT VOLSER   ADC005

RECORD   1   434  S:   Also classified A4Vm.
RECORD   2   443  D:   Astrometric binary unresolved by
RECORD   3             speckle interferometry 1975-6.
RECORD   4   698  S:   Also classified B7+B:.
RECORD   5        Var: NSV 74.  7.07-7.11V.  SB originally
RECORD   6             thought to be eclipsing is not eclipsing.
RECORD   7        SB:  55.9212d, e 0.01, K 84.2k/s, V$0
RECORD   8             -25.6k/s, asini 65.7.  Masses about
RECORD   9             15 solar; primary undergoing mass-loss.
RECORD  10   761  D:   ADS 148, 7.3,8.1v, 68.5y, e 0.79,
RECORD  11             a 0.225", i 38°.
RECORD  12   861  S:   Metallic-line star, also classified
RECORD  13             A2m, A3V, from K-line, F2 from metallic.
RECORD  14        SB:  11.2153d, e 0.22k/s, K 43.8k/s, V$0
RECORD  15             -12.5, asini 6.59.
RECORD  16   941  M:   Highly evolved.
RECORD  17  1142  S:   Also classified G0V and G1III.
RECORD  18        RV:  Haute Provence gives values -15 and -40k/s.
RECORD  19  1223  Dyn: ".008.
RECORD  20  1228  Var: NSV 112.  Amp. 0.04V.
RECORD  21  1273  SB:  411.9d, e 0.58, K 13.7k/s, V$0
RECORD  22             -14.4k/s, asini 63.5.
RECORD  23  1317  N:   38 Psc.
RECORD  24        D:   Tabulated mag. and colors for blend
RECORD  25             ABC.  AB 7.16V, +0.67(B-V),
RECORD  26             +0.14(U-B).  Proper motion of C,
RECORD  27             +.073",+.090".  ADS 238AB period near
RECORD  28             20y.  Speckle interferometry AB, sep.
RECORD  29             0.186", 125°; ABxC, sep. 1.757", 111°.
RECORD  30             C, 7.79V, +0.43(B-V), -0.09(U-B), dA9.
```

```
L I S T I N G   O F   R E C O R D S   F R O M   T A P E   F I L E

            TAPE FILE NAME: YBS4 Supplement, Remarks
                   RECORDS     3552 TO     3581
                 TAPE FILE       13
             RECORD LENGTH       64 BYTES
              INPUT VOLSER     ADC005

C O L U M N
H E A D I N G                1111111111222222222233333333334444444444555555555566666666667777777777888888888899999999990000000000111111
I N D E X           123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345
                                                                                                         111111111111111

RECORD    3552 223718   D:   ADS 17054B, RV -18k/s.
RECORD    3553          Dyn: ".022.
RECORD    3554 223866   D:   ADS 17073D = ADS 17080A.  IDS lists 4
RECORD    3555               comp. for ADS 17073 and 4 for ADS 17080.
RECORD    3556 223960   RV:  Probably var., -48, -49, -57, -23k/s.
RECORD    3557 224083   D:   B is BD +28°4667 = HD 224084, 8.24V,
RECORD    3558               K0, PM +.015",+.002".
RECORD    3559 224166   C:   (U-B) -0.41 in Nicolet, -0.63 in
RECORD    3560               Bianco et.al.
RECORD    3561 224186   Var: NSV 14761.  Amp. 0.1v.
RECORD    3562          G:   Probable red giant member 61 Cyg Group.
RECORD    3563 224364   RV:  Possibly var.  -76, -49k/s.
RECORD    3564 224583   Var: S Phe.  SR, 6.93 to 8.07V, +1.48 to
RECORD    3565               1.64(E-V),+1.01 to 1.28(U-B), +1.34
RECORD    3566               to 1.58(R-I).  120d, quasi-periodic.
RECORD    3567 224850   S:   Also classified M1III.
RECORD    3568 224890   S:   Also classified Am:.
RECORD    3569 225187   Var: NSV 9.  7.056-7.15V.
RECORD    3570          G:   @sSculptor cluster.
RECORD    3571
RECORD    3572
RECORD    3573
RECORD    3574 179278S  N:   SAO number.
RECORD    3575          S:   Also classified C9I, N6e, C6,3e.
RECORD    3576          Var: V Hya.  SRa, 10.9-16p, 529.2d.
RECORD    3577               Mean mag. varies in period 18y.
RECORD    3578 250043S  N:   SAO number.
RECORD    3579          Var: NSV 3845.  6.69-6.73V.
RECORD    3580          RV:  Also +16.3K/S.
RECORD    3581          G:   NGC 2516.128.
```



NASA

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